

① You invest \$1,000 at 4.5% APR compounded monthly.

(a) How long does it take your investment to double?

$$2000 = 1000 \left(1 + \frac{0.045}{12}\right)^{12t} \rightarrow 2 = \left(1 + \frac{0.045}{12}\right)^{12t}$$

$$12t = \frac{\ln(2)}{\ln\left(1 + \frac{0.045}{12}\right)}$$

(b) How long to triple?

$$t = \frac{\ln(2)}{\ln\left(1 + \frac{0.045}{12}\right)} \div 12 = 15.43 \text{ yrs. double}$$

$$= 24.5 \text{ yrs triple}$$

②
$$\int_2^4 \frac{x^4 - 10x^2 - 2x + 4}{x+3} dx$$

$$\$ = 1000 \left(1 + \frac{.045}{12}\right)^{12t}$$

$$2 = (1.00375)^{12t}$$

$$\frac{\ln 2}{\ln 1.00375} = 12t$$

$$t = 15.43 \text{ months}$$

$$\frac{\ln 3}{\ln 1.00375} = 12t$$

$$t = 24.45 \text{ months}$$

$$\int_2^4 \frac{x^4 - 10x^2 - 2x + 4}{x+3} dx = .337$$

$$x+3 \overline{) x^4 + 0x^3 - 10x^2 - 2x + 4}$$

$$-(x^4 + 3x^3)$$

$$-3x^3 - 10x^2$$

$$-(-3x^3 - 9x^2)$$

$$-x^2 - 2x$$

$$(-x^2 - 3x)$$

$$x + 4$$

$$-(x + 3)$$

$$\int_2^4 \frac{3x^3 - 3x^2 - x + 1}{x+3} dx$$

$$f(x) = \frac{3}{4}x^4 - x^3 - \frac{1}{2}x^2 + x + \ln|x+3| + C$$

$$f(4) - f(2) = .337$$